Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
An Allocation of Spectrum	)	
For the Private Mobile Radio Services	)	RM Docket No. 9267

Reply Comments of Motorola

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SUMMARY

Motorola urges the FCC to begin a rule making proceeding to address the spectrum needs of the Private Mobile Radio Service. The petition filed by the LMCC has made a credible, sustainable claim regarding the amount of new spectrum that the PMRS users need in order to remain vibrant and competitive. Since the vast majority of respondents supported this claim, the Commission can use the rule making process to explore how best to address this need. Such an action will satisfy the Congressional direction given the FCC in the Balanced Budget Act of 1997. In addition, the Commission should consider what new authority it might need in order to be able to efficiently allocate spectrum to where it can be used the most productively.

Motorola recognizes that many of the bands suggested by the LMCC as candidates for use by the PMRS were opposed by many respondents. There were, however, no serious objections to the 1390-1400 MHz, 1427-1432 MHz, or 1670-1675 MHz proposals. Therefore, it would be appropriate for the Commission's proceeding to begin the process of immediately allocating these bands for PMRS use. We recommend that the commission then further consider which frequency bands can best be used to satisfy the remaining agreed upon, yet unmet, need.

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Motorola Inc. (Motorola) hereby submits its replies to comments filed in response to the petition for rule making submitted by the Land Mobile Communications Council.[1] As further detailed below, Motorola believes that the record strongly supports further FCC action to allocate additional spectrum for private land mobile services.

I. Background and Introduction

The LMCC, an umbrella organization comprised of entities representing a wide variety of land mobile users, articulated a strong demand for immediate and long term spectrum allocations to satisfy the communications need of non-public safety, private land mobile users for both voice dispatch services and more advanced wideband data operations. Arguing that the spectrum management needs of this user community have been ignored in favor of commercial services, the LMCC provided analysis, consistent with that developed for public safety land mobile services, that argues for an immediate allocation of 15 MHz to satisfy

[1] *Petition for Rule Making Submitted by the Land Mobile Communications Council*, In the Matter of an Allocation of Spectrum for the Private Mobile Radio Services, RM-9267, filed April 22, 1998 ("*LMCC Petition*").

existing short falls and additional allocations totaling 44 MHz and 125 MHz over the next 12 years principally to satisfy more advanced wideband applications such as mobile (and fixed) video, imaging and high speed data transmissions. Recognizing that spectrum suitable for terrestrial land mobile operations is in short supply, the LMCC identified several frequency bands that hold potential for private land mobile access on a shared basis with existing users and urged the FCC to further explore the availability of these and other potential frequency bands.

The LMCC Petition generated thousands of comments from a wide variety of interests. By far, the largest source of comments came from the amateur radio community, which generally expressed great displeasure with the suggestion that they share their spectrum allocations between 400-450 MHz with other non-government users. The vast majority of amateur radio user comments urged the FCC to consider the benefits that "hams" provide to the public interest and to avoid any diminution of access to "their" spectrum. Other incumbent users of the frequency bands discussed by the LMCC also argued against further sharing of those bands citing their own needs and public interest benefits.[2]

Beyond the debates directed at sharing and frequency band availability, the record reflects strong agreement with the fundamental premise of the LMCC Petition that the needs of the private land mobile users have been largely ignored in favor of commercial spectrum users, and that the existing spectrum management policies of the United States do not adequately accommodate non-CMRS services. It is this record that impels the FCC to

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[2] See e.g., the comments of ARINC discussing the aeronautical services use of 960-1215 MHz.

commence further rule making proceedings intended to provide more spectrum for private land mobile services.

II. PMRS need for spectrum has been demonstrated

In general, the comments that were filed agree with the basic principle that the Private Mobile Radio Services require further allocations of spectrum in order to keep businesses that depend upon these services operating efficiently and competitively. Many statements in support of the petition were filed by industry groups such as the American Petroleum Institute, the Industrial Telecommunications Association, Inc., UTC, The Telecommunications Association, the American Association of State Highway and Transportation Officials, and Forest Industries Telecommunications. The NTIA offered its support as follows:

> We agree with LMCC that private radio 'plays a vital role in our nation's business and infrastructure.' In this light, we believe that the Commission should consider ways to supplement the spectrum management benefits of competitive bidding with other new approaches appropriate to private radio services. [3]

The NTIA suggested that their "Office of Spectrum Management will be available to work with the Commission in identifying sharing possibilities, if appropriate, between PMRS and Federal operations in the mixed-use bands transferred under OBRA-93 and BBA-97."[4]

The Personal Communications Industry Association addressed quite clearly in its comments, the societal and economic reasons why such an allocation is necessary:

> [W]hile costs have dropped for the public as consumers of wireless services, the public is about to experience an increase in costs of goods

[3] Comments of the National Telecommunications and Information Administration.

[4] Comments of the National Telecommunications and Information Administration.

> for the public as consumers of the goods produced by businesses with insufficient wireless communications. This is because businesses have an increased need for internal wireless communications, but are unable in most urban areas to find available spectrum to utilize the new and varied devices which have been developed to reduce the cost of doing business.[5]

Finally, the American Radio Relay League (ARRL, whose comments are further discussed further below) agrees with the LMCC's position that a better method for providing for PMRS should be considered by the Commission:

> The League would like to understand the LMCC Petition as a means to open a public dialog on the character and needs of the PMRS industry. Indeed the League would tend to agree that the PMRS industry has not captured the Commission's attention in recent years due to a Commission focus on CMRS providers and spectrum auctions.[6]

Further, the ARRL states that "The League need not and does not dispute that the Commission has not addressed the concerns of non-public safety PMRS licensees in recent spectrum allocation decisions that provide substantial additions to CMRS allocations."[7] The ARRL goes on to suggest that the Commission should undertake a future proceeding addressing the broader issue of spectrum efficiency and needs of PMRS users. This is what Motorola advocates as well.

We recognize that, by sheer numbers, there were a far greater number of commenters that objected to portions of the petition than there were commenters supporting the petition. However, the objections focus almost exclusively on the use of some of the suggested

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[5] Comments of the Personal Communications Industry Association at page 2.

[6] Comments of the American Radio Relay League at page 21.

frequency bands. Even the groups who did not support the petition in its entirety either actively agreed with the LMCC that a need by this community had been demonstrated, or, in most cases, did not argue with this premise of the petition.

For example, Aeronautical Radio, Inc. opposed at least one of the spectrum bands which was suggested as possibly being available for PMRS use in the petition, but their statement of opposition is very typical of the vast majority of the comments in opposition to a part of the petition:

> ARINC supports LMCC's call for additional land mobile spectrum, but this need for additional private and mobile capacity cannot come at the expense of present and future aviation systems, such as those now using and those planned for the band 960-1215 MHz.[8]

Most of the objections came from members of the amateur radio community who object to allocations in the 420-450 MHz band for PMRS use. However, as noted above, the ARRL, representing these users, supports the need for the FCC to consider how it provides for the PMRS community. NTIA, as well, registered support for the basic premise (as above), but opposed the use of certain bands.

The record in the instant petition shows broad agreement that an unmet need exists. In addition, the Commission must consider how to address the direction given it in the Balanced Budget Act of 1997:

> The conferees considered expanding the total reallocation under section 3002(e) to allow for additional allocations for private wireless users, but were unable to do so within the context of the Reconciliation process. Nevertheless, the conferees expect the Commission and the NTIA to

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[7] Comments of the American Radio Relay League at page 3.

[8] Comments of Aeronautical Radio, Inc. at page 1

> consider the need to allocate additional spectrum for shared or exclusive use by private wireless services in a timely manner. [9]

The Commission can use the opportunity afforded by the LMCC petition to comply with this direction. Without additional spectrum, the PMRS will continue to experience degradation in its narrowband services and will be unable to implement wideband services. As is the case with nearly every spectrum proceeding, identifying suitable spectrum for PMRS use has proven contentious. Given the benefits derived through a vibrant private mobile radio service, the FCC must proceed with a rule making proceeding to assess the availability of the bands identified in the LMCC Petition, as well as bands currently slated for auctions such as the 746-806 MHz and 1710-1755 MHz bands.[10]

III. The LMCC Petition is not Premature

The ARRL, among others, argues that the LMCC Petition is premature and states:

> The petition, more fundamentally, is premature, and thus subject to dismissal, per the provisions of Section 1.401(e) of the Commission's Rules. This is because the Commission has just completed its "Refarming" proceedings in PR Docket 92-235. That proceeding was specifically intended to substantially increase efficiency of use of existing PMRS bands below 800 MHz, thus to alleviate spectrum shortfalls for PMRS. The results of the Commission's actions in those proceedings in terms of PMRS efficiency, and thus the spectrum needs of PMRS licensees in the near term, are undetermined. It is therefore impossible at this juncture for the Commission to find that there are

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[9] Section 3002(e)--Identification and reallocation of auctionable frequencies, from the Conference Report of the 1997 Balanced Budget Act.

[10] A number of commenters strongly recommend that the FCC should consider whether the commercial portions of the 746-806MHz and additional reclaimed TV spectrum can be used to resolve the needs of the PMRS, e.g., see "Tallahassee Amateur Radio" at 8.

> additional allocation needs for the PMRS, much less to quantify such or propose specific allocations therefor.[11]

Motorola disagrees with this position. By its nature, refarming leads to more channels of narrower bandwidth, not more spectrum. This does not address the needs of the private community for higher bit rate services necessitating wider bandwidth channels. As API offered in its comments "Of particular need to PMRS users in the oil and natural gas industries is spectrum on which various wideband applications such as mobile data and slow-scan video systems could be implemented.[12] This is only one example among many of the kinds of services that private users require which will demand higher data rate capability.

The ARRL further argues that refarming should, or at least can, solve the spectrum shortage problems faced by private users with the comment "PMRS users, however, control their own destinies in this respect: they can realize the efficiencies of the refarming decisions sooner, rather than later."[13] This is not necessarily true. First, many aspects of the FCC's refarming actions remain pending for further FCC review including implementation of the 12.5 kHz channeling plan at UHF frequencies. Second, the logistics of refarming pose formidable barriers to a widespread, rapid replacement of existing systems, which would help to create additional capacity in those bands. An example of this is the inherent requirement for a licensee to get his adjacent channel neighbor to simultaneously convert to narrowband technology (otherwise, new interference will occur as a result of placing a 12.5 kHz channel

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[11] Comments of the American Radio Relay League at page 2.

[12] Comments of the American Petroleum Institute at page 3.

12.5 kHz away from a 25 kHz user).[14] Third, it has long been known that the ultimate 4:1 channel split will not result in four times the number of channels at the same communications quality level, due to increased adjacent channel interference potential.

Given these and other factors, refarming projections contained in Appendix C of the LMCC petition are quite conservative and could actually underestimate the net spectrum needed. For example, the projection concludes that in 7.5 years from now, 72% of all existing VHF and UHF systems will be (voluntarily) converted to narrowband channels, which is a very optimistic target. The year 2010 assumption also seems very aggressive, but still "only" achieves a net 2.12:1 overall spectrum use improvement factor.

Finally, it should be noted that the PMRS industry has invested very substantial amounts of time and money into the refarming process to date, and any aspersions of "foot-dragging" are completely unwarranted.[15] For instance, TIA, of which Motorola is a member, has successfully addressed the industry's and FCC's cry for help in providing technical guidance for the future, very complex,[16], refarmed world. The result, TSB-88, is the first ever systems based document, consuming more than three years of combined TIA/IEEE work to

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[13] Comments of the American Petroleum Institute at page 8.

[14] Motorola has petitioned to clarify this situation, such as to minimize this logistical barrier. The FCC has not acted on same to date. *See*, Petition for Clarification, PR Docket 92-235 filed by Motorola, Inc., February 14, 1997. This petition remains pending.

[15] Cortland E. Richmond argues that "Petitioners cannot legitimately claim that refarming will be of limited help when the petitioners and other have hindered its speedy completion." Comments of Cortland E. Richmond on a Petition for Rule Making Submitted by the Land Mobile Communications Council at ¶ 18.

complete. Building upon this, frequency coordination software providers such as EDX, RadioSoft, CET, etc. have designed, or are actively designing, the TSB-88 analysis into operable software programs to be used in the day-to-day frequency coordination process. Finally, frequency coordination organizations, most of which are active LMCC members, have implemented and integrated these not-inexpensive software solutions into their operations, extending even further to accommodate the new, consolidated spectrum "pools" defined by the FCC, with such investments including new database processes and inter-coordinator database sharing. Criticisms of the PMRS industry in these regards are therefore very inappropriate.

IV. Commercial carriers will not provide for all PMRS needs

Some respondents argue that the LMCC petition does not allow for the possibility that commercial carriers may be able to absorb the traffic load of private wireless users. ARRL states "Furthermore, while LMCC has discounted completely the ability of businesses and industry to utilize CMRS providers in lieu of PMRS service, the effect of the recent initiation of new CMRS service by companies such as Nextel and other E-SMR carriers has yet to be determined."[17] Likewise, the USDA states that "One alternative that could assist in meeting LMCC's requirements is the dispatch/cellular network offered by Nextel."[18]

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[16] The refarmed PMRS spectrum will consist of multiple bandwidths, multiple technologies, and multiple applications, all operating simultaneously in the same geographic and spectral space.

[17] Comments of the American Radio Relay League at page 9.

[18] Input of the USDA provided to the NTIA. Another contribution to the NTIA comments which ran counter to the NTIA's overall support came from the FBI and DOJ who said "No spectrum should be allocated for other uses until the remaining 73.5 MHz of spectrum have been provided for public safety allocations." While Motorola strongly supports the needs of the

Contrary to such comments, the LMCC petition did, in fact, include in its projection of spectrum need that a substantial portion of the traffic would be carried on third party commercial networks. The spectrum requirements that LMCC concludes are *after* accounting for third party suppliers. The requirement concluded for the year 2000, for example, is for 22.35 MHz of additional spectrum needed, with 7.32 MHz of that assumed to be provided by commercial networks. This is an assumption of 33% of the additional need being provided by commercial carriers. Equally telling, in the year 2010 calculation, a full 52.2% of the narrowband need (voice/data/status-message) is assumed to be supplied by commercial services.

Furthermore, for all of the reasons spelled out in the LMCC petition, commercial services will not provide for *all* the requirements of private system users, at least for the foreseeable future. The users themselves make this point repeatedly in their comments. PMRS users are not primarily in the business of communications and have no ulterior motive in desiring to maintain private communication facilities. Were commercial providers to offer a solution that improved these industries' productivity and competitiveness, they would have the incentive to switch to those providers. However, that is not now the case. The fact that Federal users continue to maintain their own communications systems rather than migrating wholesale to commercial systems serves to illustrate that there are requirements which cannot be filled by commercial providers. In the words of some of the users and their representatives:

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public safety community, we note that the immediate needs of this community have been addressed by the Commission's recent activity to transfer 24 MHz of spectrum from TV broadcast to public safety exclusive use. In the same vein, the LMCC report details a spectrum need that has immediate and longer- term components. The immediate requirement for spectrum faced by American business and industry should be handled with as much respect as that faced by the law enforcement community. In fact, APCO, as a member of the LMCC, supports the statement that the FCC should commence a rulemaking aimed at solving this spectrum crisis. However, we agree with the FBI and DOJ in that the FCC does not currently

"Commercial systems, such as cellular, SMR, paging, and PCS are used, but they can only minimally accommodate the mobile communications requirements of the industry."[19]

"Utilities and pipelines, for example, have unique operating characteristics that make it difficult, and in many cases impossible, for them to take service from commercial providers."[20]

"PCIA does not mean to suggest that commercial communications can never serve business communication needs. In fact, SMR Systems, PCS and other shared communications systems serve the business communications needs of thousands of users. However, as documented in the LMCC Petition and historically recognized by the Commission through the decades, commercial systems can not meet all business communications needs."[21]

"Quite often, a customer has been forced into using a commercial system such as cellular telephones or Nextel radios, simply because they had no other viable options. These commercial systems often do not provide the group communication ability that many of our customers have relied upon for years to increase productivity and efficiency. The customer is also left to shoulder the burden of a high cost of communication, a cost that is ultimately passed on to the consumer in one form or another. When it comes to safety and performance, many of our customers simply cannot afford to be subjected to a service availability of less than 99.9% reliability. Many commercial systems do not offer this degree of reliability, and cannot guarantee our customers priority access in cases of emergency. With cellular phones or paging services, the issue of immediate contact is a major concern in life and death situations."[22]

"The entire state of South Dakota has only about 750,000 residents. We cannot depend upon the vast buildout of some new wireless system to

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have any plan to satisfy the additional public safety spectrum requirements as defined in the PSWAC report, and that such a plan should be put in place.

[19] Comments of Forest Industries Telecommunications at page 2.

[20] Comments of UTC in Support of LMCC Petition for Rule Making at page 5.

[21] Comments of the Personal Communications Industry Association at page 3.

[22] Comments of Andy Smith from Scott Communications, Inc.

> provide the necessary wireless communication for our area because the commercial wireless companies will not invest the millions of dollars necessary to build out a state wide system because the return on investment would be too low. If cellular, which is the most mature modern "wireless" commercial service, cannot afford to cover these areas, the new digital providers with even more expensive infrastructure are certainly not going to leap into a speedy buildout. Even the new FCC rules that require wide area licensees to cover a certain portion of the population within a few years will not help this situation since you can cover about 75% of our population by only covering about 20% of the geography. This would leave us in a worse predicament that we face today, with about 80% of the land area not being serviced by commercial wireless providers."[23]

The reasons behind these comments and observations will likely result in a further reduction in the ability of commercial carriers to serve for all the needs of PMRS as wideband applications become more available and critical to businesses. For instance, the ability of commercial service providers below 1 GHz to service the private wideband needs is essentially non-existent today and will remain so, especially for wireless video. Though PCS systems theoretically have the spectrum to provide wideband channels, their need to operate standards based systems that match consumer market demand will make it difficult for them to do so. Over and above their market priorities, PCS operators face other obstacles.

(1) There are no current "wideband" standards in existence that they could implement, even if they wanted to do so.[24]

(2) PMRS wireless video/imaging will be strongly "uplink oriented" (from field operatives to the fixed end decision making center) vs. a strong down-link public system orientation (e.g. down-loading internet images).

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[23] Comments of Michael A. Lees, President of Western Communications, Inc.

[24] PMRS has a history of being able to implement substantial technical advances without the need for pre-existing widely accepted public standards. In fact, many of these implementations become the drivers for subsequent public system implementations.

(3) Packet-switched data orientations of public systems (appropriate for short messaging) will be mismatched to the probable circuit-switched requirements of PMRS video/imaging.

(4) Public systems must implement functions over basically their entire operating area, which will be very cost prohibitive to serve the geographically segmented PMRS needs (at least in the early stages). In addition, there may be a need to deploy over adjacent license areas (in order to serve large PMRS systems, for instance a statewide utility, pipeline, railroad, etc.).

V. Conclusion

As stated above, Motorola believes that the record on this proceeding compels the Commission forthwith to begin a rule making process.[25] The 1997 Balanced Budget Act clearly calls for the Commission to act rapidly to address the needs of this community. The LMCC petition spells out and substantially documents the requirements, and comments to the petition do not argue that point. We urge the Commission to begin a public dialog to address how it can best respond to that need, and what, if any, additional authority it should seek in order to fulfill its role as the nation's spectrum manager.

Respectfully Submitted,

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[25] Such a rulemaking procedure should envision, amongst other things, an immediate allocation of the 1390-1400/1427-1432/1670-1675MHz spectrum to PLMRS, as there appears to be no disagreement in the record as to either the need or use of this spectrum to help satisfy that need.